UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,066	07/31/2003	Horst K. Wieder	080488-0127	2047

23524 7590 03/30/2006

FOLEY & LARDNER LLP
150 EAST GILMAN STREET
P.O. BOX 1497
MADISON, WI 53701-1497

EXAMINER	
EWALD, MARIA VERONICA	
ART UNIT	**PAPER NUMBER**
1722	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/632,066	WIEDER, HORST K.
	Examiner	**Art Unit**
	Maria Veronica D. Ewald	1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) *30-46 and 50-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29 and 47-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 4, 7 – 10, 12 – 18, 23 – 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsutsumi (U.S. 4,976,900). With respect to claims 1 – 4, Tsutsumi teaches an apparatus comprising: an injection mold having one or more portions (column 2, lines 25 – 27, 55 – 57), a gas supply tube containing a gas at a first pressure (item 11 – figure 1; column 3, lines 1 – 2), an orifice member having an orifice thereon in thermal communication with at least one portion of the injection mold, wherein the orifice member is operably coupled to receive the gas from the gas supply tube, and wherein the orifice member is adapted to release the gas from the gas supply tube through the orifice (items 10 and 13 – figure 1; column 3, lines 2 – 8) and a gas exhaust channel containing the gas at a second pressure, wherein the gas exhaust channel is operably coupled to receive the gas from the orifice member and wherein the second

pressure is lower than the first pressure (item 22 – figures 1 and 3; column 4, lines 20 – 25), whereby at least one portion of the mold is cooled (column 4, lines 1 – 2). The reference further teaches that the gas includes air (column 5, lines 44 – 46); that at least a portion of the gas supply tube is cylindrical (item 11 – figure 1; column 3, lines 1 – 2) and at least a portion of the gas exhaust channel is cylindrical (item 22 – figures 1 and 3; column 4, lines 20 – 22).

With respect to claims 7 – 10, the reference further teaches that the gas exhaust channel includes a bore portion having a closed distal end located within the injection mold (item 22 – figures 1 and 3), wherein the gas supply tube (item 11 – figure 1) includes a pipe portion with an end having at least one orifice member (item 10 – figure 1), and wherein at least a portion of the end of the pipe portion of the gas supply tube is positioned in thermal contact with the closed distal end of the bore portion of the gas exhaust channel (figure 3; column 4, lines 20 – 25); wherein the gas exhaust channel includes a bore portion having a closed distal end located within the injection mold (item 22 – figures 1 and 3), wherein the gas supply tube (item 11 – figure 1) includes a pipe portion with an end having at least one orifice member (item 10 – figure 1), and wherein at least a portion of the end of the pipe portion of the gas supply tube is positioned adjacent to the closed distal end of the bore portion of the exhaust channel (figure 3; column 4, lines 20 – 25); wherein the gas exhaust channel includes a bore portion (item 22 – figures 1 and 3), wherein the gas supply tube includes a bore portion (item 11 – figure 1; column 3, lines 1 – 2), and wherein the orifice member has a first side operably coupled to the bore portion of the gas supply tube and a second side operably coupled

lo the bore portion of the gas exhaust channel (item 10 – figure 1; column 3, lines 1 – 12; column 4, lines 18 – 22); and wherein the apparatus is further comprised of the gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube, and wherein the gas supply system includes at least one gas cooler adapted to cool the supply of gas at the first pressure (item 12 – figure 1; 29 – 42).

With respect to claims 12 – 18, Tsutsumi further teaches the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube, and wherein the gas supply system can be operated to adjust the flow rate of the gas at the first pressure between a non-zero flow rate and a flow rate which is essentially zero (item 12 – figure 1; column 3, lines 3 – 4, 13 – 15); that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube and wherein the gas supply system can be operated to adjust the flow rate of the gas at the first pressure to two or more non-zero flow rates (item 12 – figure 1; column 3, lines 3 – 4, 13 – 15); that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube, and wherein the gas supply system can be operated to adjust the magnitude of the pressure of the gas at the first pressure (item 12 – figure 1; column 3, lines 3 – 4, 13 – 15); that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube wherein the gas supply system can be operated to adjust the magnitude of the pressure of the gas at the first pressure, and a controller operably coupled to operate the gas supply system (item 12 – figure 1; column 3, lines 3 – 4, 13 – 15).

Furthermore, the reference teaches that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube wherein the gas supply system can be operated to adjust the flow rate of the gas at the first pressure, and a controller operably coupled to operate the gas supply system (item 12 – figure 1; column 3, lines 3 – 4, 13 – 15); that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube wherein the gas supply system can be operated to adjust the flow rate of the gas at the first pressure, a temperature sensor adapted to measure the temperature of at least one portion of the injection mold and to produce at least one temperature signal, and a controller operably coupled to receive the at least one temperature signal from the temperature sensor and operably coupled to operate the gas supply system (item 12 – figure 1; column 3, lines 3 – 4; column 4, lines 29 – 42); and that the apparatus of be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube wherein the gas supply system can be operated to adjust the magnitude of the pressure of the gas at the first pressure, a temperature sensor adapted to measure the temperature of at least one portion of the injection mold and to produce at least one temperature signal, and a controller operably coupled to receive the at least one temperature signal from the temperature sensor and operably coupled to operate the gas supply system (item 12 – figure 1; column 3, lines 3 – 4; column 4, lines 29 – 42).

With respect to claims 23 – 29, Tsutsumi teaches that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first

pressure to the gas supply tube (item 12 – figure 1) and a gas exhaust system operatively coupled to receive the gas at the second pressure from the gas exhaust channel (item 22 – figure 1) wherein the gas supply system is operably coupled to receive the gas at the second pressure from the gas exhaust system (item 12 – figure 1; column 4, lines 22 – 25); wherein at least a portion of the orifice member is in thermal contact with the at least one portion of the injection mold, thereby providing thermal communication between the orifice member and the at least one portion of the injection mold (column 3, lines 5 – 12); wherein at least a portion of the gas released from the orifice member strikes the at least one portion of the injection mold, thereby cooling the at least one portion of the injection mold (column 3, lines 5 – 12, 67 – 68; column 4, lines 1 – 4); that the apparatus be further comprised of a thermally conductive member, wherein at least a portion of the thermally conductive member is in thermal contact with at least a portion of the orifice member, and wherein at least a portion of the thermally conductive member is in thermal contact with the at least one portion of the injection mold, thereby cooling the al least one portion of the injection mold (column 3, lines 5 – 12, 67 – 68; column 4, lines 1 – 4); that the apparatus be further comprised of a thermally conductive member, wherein at least a portion of the gas released from the orifice member strikes at least a portion of the thermally conductive member, and wherein at least a portion of the thermally conductive member is in thermal contact with the at least one portion of the injection mold, thereby cooling the at least one portion of the injection mold (column 3, lines 5 – 12, 67 – 68; column 4, lines 1 – 4); and that the apparatus be further comprised of a gas supply valve, wherein the gas supply tube is

operably coupled to receive the gas at the first pressure from the gas supply valve (item 15 – figure 1; column 3, lines 12 – 15) and wherein the gas supply valve can be operated to adjust the flow rate of the gas at the first pressure between a non-zero flow rate and a flow rate which is essentially zero (item 15 – figure 1; column 3, lines 12 – 15).

Claims 1 – 16, 23 – 29 and 47 – 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Frul, et al. (U.S. 2002/0162940 A1). With respect to claims 1 – 6, Frul, et al. teaches an apparatus comprising: an injection mold having one or more portions (paragraph 0001 – 0002), a gas supply tube containing a gas at a first pressure (figure 11; paragraph 0040), an orifice member having an orifice thereon in thermal communication with at least one portion of the injection mold (item 47 – figure 11; paragraph 0041), wherein the orifice member is operably coupled to receive the gas from the gas supply tube, and wherein the orifice member is adapted to release the gas from the gas supply tube through the orifice (item 47 – figure 11; paragraph 0041) and a gas exhaust channel containing the gas at a second pressure, wherein the gas exhaust channel is operably coupled to receive the gas from the orifice member (item 43 – figure 10; paragraphs 0041 – 0042) and wherein the second pressure is lower than the first pressure (paragraphs 0043 – 0044), whereby at least one portion of the mold is cooled (paragraph 0040). The reference further teaches that the gas includes air (paragraphs 0009, 0044); that at least a portion of the gas supply tube is cylindrical (figure 10); wherein at least a portion of the gas exhaust channel is cylindrical (figure 10); wherein

at least a portion of the gas supply tube is surrounded by the exhaust channel (figure 10); wherein at least a portion of the gas supply tube is surrounded by an insulating jacket (figure 10).

With respect to claims 7 – 10, the reference further teaches that the gas exhaust channel includes a bore portion having a closed distal end located within the injection mold (figure 10), wherein the gas supply tube (item 46 – figures 10 and 11; paragraph 0041) includes a pipe portion with an end having at least one orifice member (item 47 – figures 10 and 11), and wherein at least a portion of the end of the pipe portion of the gas supply tube is positioned in thermal contact with the closed distal end of the bore portion of the gas exhaust channel (item 43 – figure 10; paragraph 0040); wherein the gas exhaust channel includes a bore portion having a closed distal end located within the injection mold (figure 10), wherein the gas supply tube includes a pipe portion with an end having at least one orifice member (item 46 and 47 – figures 10 and 11), and wherein at least a portion of the end of the pipe portion of the gas supply tube is positioned adjacent to the closed distal end of the bore portion of the exhaust channel (figure 10); wherein the gas exhaust channel includes a bore portion (figure 10), wherein the gas supply tube includes a bore portion (figure 10), and wherein the orifice member has a first side operably coupled to the bore portion of the gas supply tube and a second side operably coupled to the bore portion of the gas exhaust channel (figure 10; paragraphs 0041 – 0043); and wherein the apparatus is further comprised of the gas supply system operably coupled to supply the gas at the first pressure to the gas

supply tube, and wherein the gas supply system includes at least one gas cooler adapted to cool the supply of gas at the first pressure (paragraph 0044).

With respect to claims 11 – 16, Frul, et al. further teach that the apparatus is further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube, and wherein the gas supply system includes at least one gas compressor; wherein the gas supply system can be operated to adjust the flow rate of the gas at the first pressure between a non-zero flow rate and a flow rate which is essentially zero (paragraphs 0042 – 0043); that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube and wherein the gas supply system can be operated to adjust the flow rate of the gas at the first pressure to two or more non-zero flow rates (paragraphs 0042 – 0043); that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube, and wherein the gas supply system can be operated to adjust the magnitude of the pressure of the gas at the first pressure (paragraphs 0040 – 0043); that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube wherein the gas supply system can be operated to adjust the magnitude of the pressure of the gas at the first pressure, and a controller operably coupled to operate the gas supply system (paragraphs 0043 – 0044). Furthermore, the reference teaches that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube wherein the gas supply system can be operated to adjust the flow rate of the gas at the first pressure,

and a controller operably coupled to operate the gas supply system (paragraphs 0043 – 0044).

With respect to claims 23 – 29, Frul, et al. teach that the apparatus be further comprised of a gas supply system operably coupled to supply the gas at the first pressure to the gas supply tube (paragraph 0040) and a gas exhaust system operatively coupled to receive the gas at the second pressure from the gas exhaust channel (item 43 – figure 10) wherein the gas supply system is operably coupled to receive the gas at the second pressure from the gas exhaust system (item 43 – figure 10; paragraphs 0041 – 0042); wherein at least a portion of the orifice member is in thermal contact with the at least one portion of the injection mold, thereby providing thermal communication between the orifice member and the at least one portion of the injection mold (figure 10; paragraph 0040); wherein at least a portion of the gas released from the orifice member strikes the at least one portion of the injection mold, thereby cooling the at least one portion of the injection mold (paragraph 0040); that the apparatus be further comprised of a thermally conductive member, wherein at least a portion of the thermally conductive member is in thermal contact with at least a portion of the orifice member, and wherein at least a portion of the thermally conductive member is in thermal contact with the at least one portion of the injection mold, thereby cooling the at least one portion of the injection mold (paragraph 0040); that the apparatus be further comprised of a thermally conductive member, wherein at least a portion of the gas released from the orifice member strikes at least a portion of the thermally conductive member, and wherein at least a portion of the thermally conductive member is in thermal contact with the at least

one portion of the injection mold, thereby cooling the at least one portion of the injection mold (figures 6 and 10; paragraphs 0029 and 0040); and that the apparatus be further comprised of a gas supply valve, wherein the gas supply tube is operably coupled to receive the gas at the first pressure from the gas supply valve (paragraphs 0029 and 0040) and wherein the gas supply valve can be operated to adjust the flow rate of the gas at the first pressure between a non-zero flow rate and a flow rate which is essentially zero (paragraphs 0029 and 0040).

Claims 47 – 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Frul, et al. (U.S. U.S. 2002/0162940 A1). Frul, et al. teach an apparatus comprising: an injection mold having one or more portions (paragraph 0001); a pipe containing a gas (figure 10; paragraph 0009 and 0040) at a first pressure and having at least one orifice member in thermal communication with at least one portion of the injection mold (item 47 – figure 10) and a bore in the injection mold at least partially surrounding the orifice member and containing the gas at a second pressure, wherein the second pressure is no higher than the first pressure and further wherein the bore provides an exhaust channel for the gas (item 43 – figure 10); whereby the release of gas from the pipe through the orifice member into the bore cools the at least one portion of the injection mold (paragraph 0040). Frul, et l. further teach that the bore has a distal end at least partially surrounded by the injection mold (figure 10), wherein the pipe has an end at least partially surrounded by the distal end of the bore (figure 10), and wherein the orifice member is located at the end of the pipe (items 46 and 47 – figure 10). In addition, Frul, et al. teach that the gas includes air (paragraphs 0009 and 0040).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17 – 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frul, et al. in view of Larsson (U.S. 5,460,761). Frul, et al. teach the characteristics previously described but do not teach that the apparatus have a gas exhaust system/channel with separate controllers that also surrounds the gas supply tube.

In a method to cool the mold in an injection molding apparatus, Larsson teaches that media used to regulate and cool the mold temperature can comprise of carbon dioxide, nitrogen, air or another gas (column 3, lines 18 – 20). In another embodiment, Larsson teaches that liquid carbon dioxide can also be used, which ultimately expands to become a cooling gas and is exhausted from the mold through a series of piping (column 5, lines 58 – 61). To cool the mold, there is a gas supply tube (items 6 and 8 – figure 1), which supply the cooling gas to the molding parts from a container (item 17 – figure 1). The supply tubes run freely into expansion rooms where the cooling gas expands and ultimately cools the mold (items 5 and 7 – figure 1; column 5, lines 42 – 45). The supply tubes are also surrounded by recesses (items 13 and 14 – figure 1). Larsson then teaches that the use of the capillary or supply tubes partially surrounded and through which cooling gas is expelled provides a more optimum temperature and

cooling control mechanism (column 5, lines 5 – 6, 16 – 17). Furthermore, the entire cycle time for cooling the mold can be reduced (column 2, lines 58 – 59).

To adequately exhaust and control the evacuation of the gas from the molding apparatus, Larsson teaches that the cooling gas can be evacuated through pipes (item 19 – figure 1) and controllably evacuated using hand valves and a control unit (items 20 and 21 – figure 1; column 5, lines 61 – 67). In addition, working in cooperation with the controller, there is a thermoelement, which monitors and regulates the temperature of the mold (column 6, lines 38 – 39, 41 – 43). This reads on the Applicant's claims that the apparatus be further comprised of a gas exhaust system operably coupled to receive the gas at the second pressure from the gas exhaust channel wherein the gas exhaust system can be operated to adjust the magnitude of the pressure of the gas at the second pressure and a controller coupled to operate the gas exhaust system; wherein the system further includes a temperature sensor adapted to measure the temperature of at least one portion of the injection mold and to produce at least one temperature signal, and a controller operably coupled to receive the at least one temperature signal from the temperature sensor and operably coupled to operate the gas exhaust system; and that the apparatus be further comprised of a gas exhaust valve operably coupled to receive the gas at the second pressure from the gas exhaust channel.

Therefore, it would have been obvious at the time of the Applicant's invention to one of ordinary skill in the art to modify the cooling apparatus of Frul, et al. with the gas exhaust system configuration of Larsson for the purposes of providing an ideal cooling

and temperature controlling mechanism, shortening the cycle time and adequately controlling the evacuation of the cooling gas from the mold cavity as taught by Larsson (column 2, lines 58 – 59; column 5, lines 5 – 6, 16 – 17, 61 – 67).

Response to Arguments

15. Applicant's arguments with respect to claims 1 and 47 have been considered but are moot in view of the new ground(s) of rejection. Applicant has argued that both Tsutsumi and Larsson do not teach that the entering gas and exiting gas are at a first and second pressure, respectively. In addition, Applicant argued that Larsson did not teach that the gas exhaust channel differed from the gas inlet or tube, since the gas exited from the capillary tubes, the same tubes through which the gas enters the expansion room to cool the mold cavity. Examiner agrees that Larsson does not teach that the gas inlet and gas exhaust are different; however, Examiner disagrees with Applicant's argument that Tsutsumi fails to teach that the gas entering the pipe is at a first pressure and the exhausted gas is at a second pressure. Tsutsumi may not explicitly teach that the gas enters and exits at differing pressures; *however, Tsutsumi does teach there is a nozzle on the end of the air passing pipe* (item 14 – figure 2) which touches the metal mold and through which the air stream exits to cool the mold (column 3, lines 40 – 55). *For the air to gush out of the nozzle, as taught by Tsutsumi, it must leave at a high pressure,* which then dissipates. In addition, though the air-aspirating pipe, as Applicant argues, pulls the air stream, the apparatus is capable of

operating at a second pressure at and/or lower than the air pressure exiting the nozzle, since it is connected to the stream controller.

In addition, Examiner has also cited the reference of Frul, et al. Frul, et al. teach an apparatus for cooling an injection mold, such that there is a system of nozzles placed within a support structure enclosing the mold cavity (paragraph 0025). Frul, et al. further teach that the cooling system can be comprised of a gas (paragraph 0009). In addition, though Frul, et al. do not specifically teach that the gas entering the nozzles is at a first pressure and the exhausted gas is at a second pressure, the apparatus *is capable of operating as such,* since the pressure of the gas in the inlet tube must be sufficient and greater than the exiting gas in the exhaust channel (item 43 – figure 10), since the gas exits the tube (item 46 – figure 10 and 11) through a nozzle, therefore, the increased pressure allows the gas to exit the nozzle, which then dissipates and eventually exits through the opening (item 43 – figure 10), thereby, cooling the mold. The dissipation of gas through the outlet, creates a second pressure that is less than that of the gas behind and exiting the nozzle in the inlet system (paragraph 0044). Furthermore, though the embodiments shown by Frul, et al. teach an air/water mixture, the piping is capable of handling a gaseous flow, and thus, the piping can be correctly termed a gas supply tube and a gas exhaust channel, since *the tube is supplying gas and the exit pipe is discharging gas* even though the system is supplying a gas with liquid. As written, claim 1 does not exclude any liquid from being mixed with the gas, nor specifies that the apparatus can only be used with a gas.

With respect to claim 47, Examiner has also applied the reference of Frul, et al. since Frul, et al. do teach that there is bore surrounding the orifice and containing the gas at a second pressure, and further wherein the bore provides an exhaust channel for the gas.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph S Del Sole
JOSEPH S. DEL SOLE
PRIMARY EXAMINER
3/24/06

MVE